is impossible" (p. 114). *"All the scientist creates in a fact is the language in which he enunciates it"* (p. 121). "Since the enunciation of our laws may vary with the conventions we adopt, since these conventions may modify even the natural relations of these laws, is there in the manifold of these laws something independent of these conventions and which may, so to speak, play the rôle of the *universal invariant*? . . . In any case a minimum of humanity is necessary" (pp. 127–8). "All classification supposes the active intervention of the classifier" (p. 135). "Sensations are therefore intransmissible, or rather all that is pure quality in them is intransmissible and forever impenetrable. But it is not the same with relations between these sensations" (p. 136). "Nothing is objective except what is identical for all; now we can only speak of such an identity if comparison is possible, and can be translated into a 'money of exchange' capable of transmission from one mind to another. Nothing, therefore, will have objective value except what is transmissible by 'discourse,' that is, intelligible" (p. 137). "All that is not thought is pure nothingness; since we can think only thought and all the words we use to speak of things can express only thoughts, to say there is something other than thought is, therefore, an affirmation which can have no meaning" (p. 142).

It is plain enough, from these representative and characteristic selections, that M. Poincaré has not acquired familiarity with psychological investigation; that, as yet, he has not compelled himself to think through to a definite, coordinated, basis in epistemology; that his logical methods tend to gloss the secondary character of symbolism; and, above all, that he has not clarified the ultimate metaphysical problem immanent in his acute dialectics. But of these limitations, as the professional philosopher will at once see them, I incline to make light. For it is an immense gain that M. Poincaré should have insisted, not merely upon the existence of such riddles, but upon their fundamental import for an evaluation of scientific modes of presentation.

The book ought to be in the hands of all who desire to "mix their colors with brains."

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Atlas of Absorption Spectra. By H. S. UHLER and R. W. WOOD. Carnegie Institution of Washington, Washington, D. C., 1907.

"To furnish graphical representations, on a normal scale of wave-lengths, of the absorption spectra, both in the visible and ultraviolet regions, of a reasonably large number of compounds," is stated by the authors as their chief object in producing this book, and with the exception of the fact that their spectrograms do not extend into the red, their object has been very well attained.

The book opens with a two-page introduction by Professor Wood, which is followed by eighteen pages including descriptions of the apparatus used, spectrograph, sources of light, photographic materials, explanation of the tables, etc. The tables occupy about forty pages, and give, in systematic form, the results obtained for 147 aniline dyes and some of their related organic compounds, and 36 miscellaneous absorbing media, chiefly inorganic salts. Twenty-six plates, 102 figures, positives of the spectra observed, complete the book.

The dispersing apparatus used was a concave grating of 98.3 cm. radius, the ruled surface of which was 1.96 cm. by 5.36 cm. Most of the photographs were taken on celluloid films, sensitized with Seed's "L-ortho" emulsion. A few photographs were taken on Cramer's Trichromatic plates, for the orange and red regions up to about .63 μ. Most of the plates extend from about .20 μ or .22 μ to about .59 μ or .60 μ, where the Seed plates cease to be sensitive for normal exposures.

A Nernst glower carrying .8 ampere on a 104 volt 133 cycle circuit, furnished a continuous spectrum down to about .32 μ or .34 μ. A spark between electrodes, one of sheet brass and the other of equal parts of zinc and cadmium, furnished a bright line spectrum from about .2 μ up. The spark spectrum was cut off from the plate by a movable screen

for all wave-lengths greater than .4 μ so that the second order ultra-violet might not overlap the continuous spectrum. The spectrum of the Nernst glower was too weak to affect the plates at .325 μ in the first order, and could not therefore have produced any effect below .650 μ by the overlapping of the second order. A 75-second exposure was usually given to the spark, then the screen was removed and a one-minute exposure given to the spectrum of the Nernst glower. The spark terminals were made very broad and chisel-shaped and their edges were placed parallel to the slit, a considerable length (about a centimeter), of which was thus illuminated. A large Leyden jar was connected across the spark gap.

An ingenious form of cell for holding the absorbing liquids is described in full. By means of it a wedge-shaped film of liquid was confined between quartz plates which could be set at any desired angle to each other and at any distance apart up to 6 mm. When properly placed before the slit the light coming to each successive point of the slit came through successively increasing thicknesses of the dye. Three exposures were usually made on each plate, their edges nearly in contact and the angle of the wedge and its position at each exposure was such that the three photographic strips showed, from the top of the first to the bottom of the last, the effect of a continuously increasing thickness of the absorbing film. The thickness at one edge was zero and at the other usually about .25 mm., although the thickness at the thicker edge varied over a considerable range.

The authors have anticipated the chief criticisms which might have been advanced against the book. In stating their "chief object" they disclaim any intention to attempt quantitative measurements or to make an exhaustive study of all known dyes. They have certainly investigated "a reasonably large number of compounds." Their statement that "only aqueous solutions of the aniline dyes have been investigated up to the present time" leads us to hope that the investigation will be continued both for other solvents and for other dyes, including some of the very important new photographic dyes which are not in their present list.

No attempt has been made to give to a high degree of exactness the positions of the absorption bands, and it is doubtful if either this or the relative strengths of the absorption bands could have been found satisfactorily with the commercial plates used. And it is perhaps because no attempt in this direction was intended that no data are given as to time of development, temperature of developing bath, etc.—nor are we told whether or not any attempt was made to secure uniformity in these respects.

The authors give ample warning that the photographic minimum in the Seed plates used may produce apparent absorption in the green. Without doubt there is much of interest in the red of many of these dyes, and it is to be regretted that the authors did not make use of some of the modern methods of plate bathing, or even of some of the later plates now obtainable commercially, both to secure a more uniform photographic sensitiveness throughout the spectrum, and to extend the observations into the red. As they point out, however, the slope of the limiting line at the red end of their plates indicates whether or not an absorption band is present in that region.

The book is very well printed and the plates seem to be excellent, although they do not seem to show all that may be seen on the original negatives, as is evidenced by a comparison of the tabulated data of some of the figures with the figures themselves, *e. g.*, in the case of potassium permanganate, Fig. 75, we are told that the negative shows seven absorption bands in and near the green. Only five of the seven can be detected in Fig. 74. The absence of typographical errors is noticeable. Under Fig. 99, however, we are referred to page 169, instead of, evidently, page 59.

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Societies and Academies

The Oregon State Academy of Sciences

The third annual meeting of the Oregon State Academy of Sciences was held at the